

THE INVENTION CLAIMED IS:

1. A method comprising:
providing a substrate having a metal seed layer;
5 applying an agitated rinse to the metal seed
layer; and
depositing a metal fill layer on the rinsed metal
seed layer by electrochemical deposition.
- 10 2. The method of claim 1, wherein the metal seed
layer comprises a copper seed layer.
- 15 3. The method of claim 1, wherein providing a
substrate having a metal seed layer comprises depositing the
metal seed layer on the substrate by physical vapor
deposition.
- 20 4. The method of claim 1, wherein both the
applying step and the depositing step are performed in the
same chamber.
- 25 5. A method comprising:
providing a substrate having a metal seed layer;
exposing the metal seed layer to a liquid that
includes a surfactant; and
depositing a metal fill layer on the metal seed
layer by electrochemical deposition.
- 30 6. The method of claim 5, wherein the metal seed
layer comprises a copper seed layer.
7. The method of claim 5, wherein providing a
substrate having a metal seed layer comprises depositing the
metal seed layer by physical vapor deposition.

8. The method of claim 5, wherein both the exposing step and the depositing step are performed in the same chamber.

5 9. The method of claim 5, further comprising: rinsing the metal seed layer after the exposing step.

10 10. A method comprising:
providing a substrate having a metal seed layer;
exposing the metal seed layer to an organic solvent; and
depositing a metal fill layer on the metal seed layer by electrochemical deposition.

15 11. The method of claim 10, wherein the metal seed layer comprises a copper seed layer.

20 12. The method of claim 10, wherein providing a substrate having a metal seed layer comprises depositing the metal seed layer by physical vapor deposition.

25 13. The method of claim 10, wherein both the exposing step and the depositing step are performed in the same chamber.

14. The method of claim 10, further comprising:
rinsing the metal seed layer after the exposing step.

30 15. A method comprising:
providing a substrate having a metal seed layer;
exposing the metal seed layer to activated hydrogen at a pressure of at least 0.1 atmosphere; and

depositing a metal fill layer on the metal seed layer by electrochemical deposition.

16. The method of claim 15, wherein the exposing
5 step is performed at substantially atmospheric pressure.

17. The method of claim 15, wherein the exposing step includes exposing the metal seed layer to a plasma that includes hydrogen.

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18. The method of claim 15, wherein the metal seed layer comprises a copper seed layer.

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19. The method of claim 15, wherein providing a substrate having a metal seed layer comprises depositing the metal seed layer on the substrate by physical vapor deposition.

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20. The method of claim 15, further including exposing the metal seed layer to activated oxygen.

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21. A method comprising:
providing a substrate having a metal seed layer;
exposing the metal seed layer to an oxidant solution so as to form an oxidized surface layer on the metal seed layer; and
depositing a metal fill layer on the metal seed layer by electrochemical deposition.

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22. The method of claim 21, wherein the oxidant solution comprises hydrogen peroxide.

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23. The method of claim 22, wherein the oxidant solution comprises a concentration of hydrogen peroxide of between about .1 percent and 6 percent.

24. The method of claim 21, wherein the metal seed layer is exposed to the oxidant solution for about one minute or less.

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25. The method of claim 21, wherein the oxidized surface layer has a thickness of about 100 angstroms or less.

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26. The method of claim 21, wherein the oxidized surface layer is adapted to reduce an occurrence of gas bubbles forming on the metal seed layer upon immersion of the metal seed layer in an electrolyte solution of an electrochemical deposition bath.

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27. The method of claim 21, wherein the oxidized surface layer is adapted to increase wettability of the metal seed layer.